

**REMARKS**

Claim 1 is pending in the application. Claim 1 has been cancelled and new claims 2- 42 have been added herein. Support for independent claim 2 is found on page 11, 1<sup>st</sup> paragraph - page 13, 1<sup>st</sup> paragraph.

Figure 9 has been amended to distinguish it from the prior art. In particular, the local RF coil has been replaced with the coil array of the present invention.

A Petition for Revival of the Application is included herewith. A Request for Continued Examination (RCE) previously was filed on April 8, 2003 along with a 3-month suspension. The RCE was deemed improper for not providing a submission as required under 37 CFR 1.53(d) and the application subsequently became abandoned. This response is believed to satisfy the requirement of a submission. Favorable reconsideration of the application is respectfully requested.

***I. OBJECTION TO FIGURE 9***

A proposed modification to Fig. 9 has been submitted herewith. A separate letter to the Draftsman and a pen-and-ink sketch showing the changes in red ink are included. The local RF coil shown in original Fig. 9 has been replaced with the RF coil of the present invention.

***II. REJECTION OF CLAIM 1 UNDER 35 USC §102(b) AND NONSTATUTORY DOUBLE PATENTING***

Claim 1 has been cancelled herein and thus the rejection of claim 1 under 35 USC 102(b) and under the judicially created doctrine of obviousness-type double patenting is moot.

### **III. NEW CLAIMS 2-42**

#### **a. Claim 2**

New claim 2 recites an integrated radio-frequency coil array that includes a first coil, a second coil located relative to the first coil, and a third coil located relative to the first coil and the second coil. The second coil and the third coil are situated such that the second coil and the third coil are electrically connected at a central ring, and the central ring falls over a central virtual ground plane of the first coil. A benefit of the configuration recited in new claim 2 is that the second and third coils are substantially invisible to the first coil, i.e., decoupled from the first coil. Moreover, the integrated structure recited in claim 2 is much more efficient when compared to prior art coil arrays.

*Srinivasan PCT Publication WO 98/37438 (Srinivasan WO '438)* discloses a radio frequency coil array wherein two smaller coils are physically isolated from a larger coil. The smaller coils are overlapped in or near a virtual ground plane of the larger coil to reduce their mutual coupling. The smaller coils, however, are not connected in the virtual ground plane of the larger coil. Instead, the smaller coils are connected indirectly to each other via the larger coil at either end of the larger coil. *Srinivasan WO '438* does not teach or suggest an integrated radio-frequency coil array wherein the second coil and the third coil are electrically connected at a central ring, and the central ring falls over a central virtual ground plane of the first coil, as recited in new claim 2 of the present application.

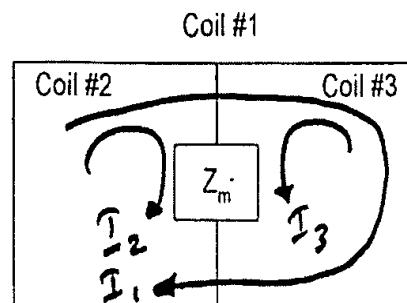
Accordingly, new claim 2 is believed to be allowable and in a condition for allowance.

#### **b. Claims 3-42**

Claims 3-42 directly or indirectly depend from new claim 2 and thus can be distinguished from *Srinivasan WO '438* for at least the same reasons.

New claim 7 depends from new claim 2 and further recites that the second coil and the third coil share a common coil path. Referring to Fig. 5 of the present application, the common coil path can be seen at the center of the first coil and includes the reactive element  $Z_m$ .

Figure 5



*Srinivasan WO '438* discloses that a first coil and a second coil are overlapped to isolate the two coils from each other. The first coil and the second coil are connected to a third coil at opposite ends on the third coil. The first coil and the second coil, however, are not directly connected to one another. Thus the first coil and the second coil do not share a common coil path. This fact is illustrated in Fig. 7b of *Srinivasan WO '438*, where it can be seen that the first coil and the second coil overlap in a center portion of the third coil and are connected on opposite ends of the third coil, e.g., points A, B and A', B' respectively. *Srinivasan WO '438* does not teach or suggest a coil array wherein the second coil and the third coil are electrically connected at a central ring, and the second coil and the third coil share a common coil path, as recited in new claim 7 of the present application.

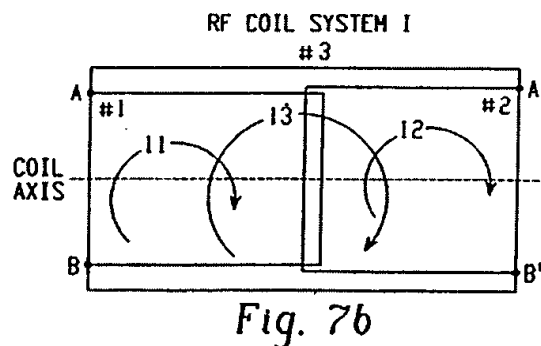


Fig. 7b

Accordingly, new claim 7 is believed to be allowable and in a condition for allowance.

New claim 8 depends from new claim 7 and further recites that the common coil path includes reactive elements. New claim 9 depends from new claim 8 and further recites that the reactive elements are chosen to cancel the coupling between the second and third coil. As stated above, *Srinivasan WO '438* does not teach or suggest a coil array wherein the second coil and the third coil are electrically connected at a

central ring, and the second coil and the third coil share a common coil path.

Therefore, *Srinivasan WO '438* cannot teach or suggest a common coil path that includes reactive elements as recited in new claim 8, and that the reactive elements are chosen to cancel the coupling between the second coil and the third coil, as recited in new claim 9.

Accordingly, new claims 8 and 9 are believed to be allowable and in a condition for allowance.

New claim 31 depends from new claim 21 and further recites a first, second and third inductive coupling loop that corresponds to the first long birdcage, the second short birdcage and the third short birdcage. Each coupling loop is coupled to a respective birdcage, and the second and third coupling loops are overlapped to cancel a net mutual flux between the respective coupling loops. New claim 32 depends from new claim 31 and recites that the coupling loop may be inductive or capacitive. New claim 33 depends from new claim 32 and recites that the coupling loop for the first long birdcage is rectangular and the coupling loop for the second and third small birdcage is a figure eight loop. *Srinivasan WO '438* does not disclose a coupling loop and thus cannot teach or suggest the elements of new claims 31-33.

Accordingly, new claims 31-33 are believed to be allowable and in a condition for allowance.

#### **IV. CONCLUSION**

Accordingly, new claims 2-42 are believed to be allowable, and the application is believed to be in condition for allowance. A prompt action to such end is earnestly solicited.

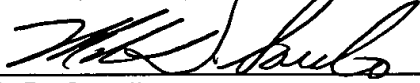
Serial No.: 09/721,249

Should the Examiner feel that a telephone interview would be helpful to facilitate favorable prosecution of the above-identified application, the Examiner is invited to contact the undersigned at the telephone number provided below.

Should a petition for an extension of time be necessary for the timely reply to the outstanding Office Action (or if such a petition has been made and an additional extension is necessary), petition is hereby made and the Commissioner is authorized to charge any fees (including additional claim fees) to Deposit Account No. 18-0988.

Respectfully submitted,

RENNER, OTTO, BOISSELLE & SKLAR, LLP

  
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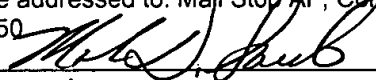
DATE: August 8, 2003

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CERTIFICATE OF MAILING

I hereby certify that this paper (along with any paper referred to as being attached or enclosed) is being deposited with the United States Postal Service on the date shown below with sufficient postage as first class mail in an envelope addressed to: Mail Stop AF, Commissioner for Patents, PO Box 1450, Alexandria, VA 22313-1450.

  
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August 8, 2003  
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DATE

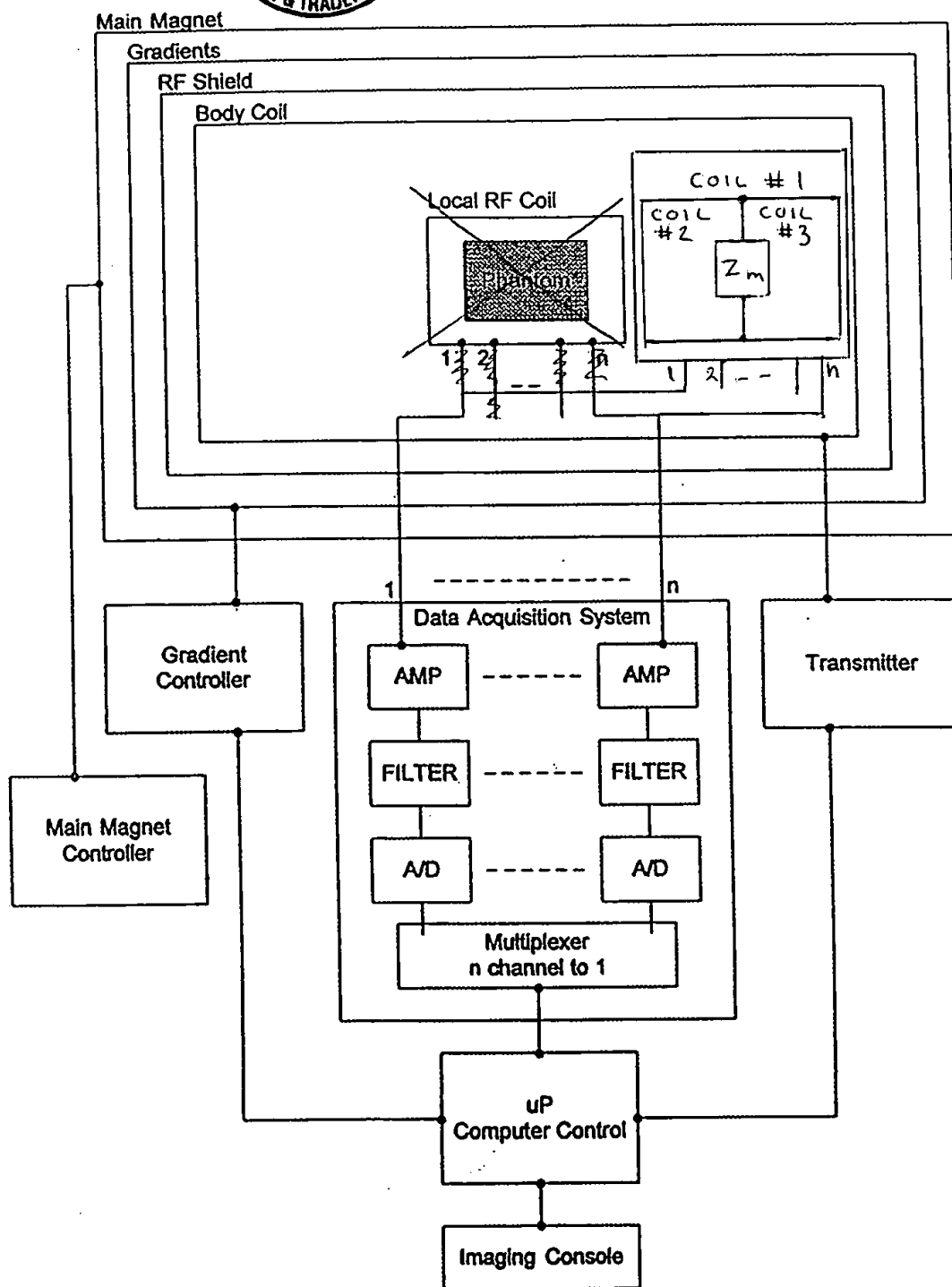


Figure 9